

An extra set of hands: A qualitative analysis of stakeholder perspectives on implementation of a modular approach to school adoption of evidence-based interventions for students with autism spectrum disorders

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Abstract

Background: Although many interventions have empirical support in improving the outcomes of students with autism spectrum disorders (ASD), schools struggle with implementation of these interventions.

Method and materials: We conducted 13 focus groups with 69 participants who included parents, educators, and administrators across three states to examine the challenges schools face in implementing evidence-based interventions (EBIs) and to evaluate the acceptability and contextual fit of the Modular Approach to Autism Programs for Schools (MAAPS). MAAPS is a comprehensive modular intervention that uses an active coaching process to guide school-based teams in selecting, planning, and implementing EBIs that are customised to meet individual student needs.

Results: Results suggest that when implementing EBIs, schools face considerable challenges including limited resources (eg funding, personnel, materials, time) and personnel training. MAAPS was considered highly acceptable primarily due to the involvement of a coach who would support the teacher. Specifically, participants indicated that the physical presence of the coach actively providing support could help relieve the stressors and burdens of the teacher.

Conclusions: Interpretations of these findings are discussed in terms of their implications on understanding the challenges schools face when adopting and implementing EBIs.

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Introduction

Students diagnosed with autism spectrum disorder (ASD) are being identified in public school settings (National Center for Educational Statistics, 2016) in increasing numbers. While this shift toward increasing identification has enabled many students with ASD to access educational and social experiences, at times alongside their typically developing peers (IDEA, 2004), it also has challenged school personnel to adequately support these students. ASD is characterised by difficulties with social communication skills such as reciprocating conversations with peers, as well as the presence of restricted or repetitive behaviours (American Psychiatric Association, 2013). In addition to these core symptoms, many students with ASD have co-occurring problems that can interfere with school success (Estes, Rivera, Bryan, Cali and Dawson, 2011; Kaat and Lecavalier, 2013). Examples include difficulty with following schedules or actively engaging in instruction and learning, and displaying disruptive behaviour such as screaming (Ashburner, Ziviani and Rodger, 2010; Schreibman, Whalen and Stahmer, 2000). Further challenging educators is the heterogeneity of ASD symptoms. For example, some students with ASD are articulate in conveying their needs, while for others this may be an impossible or highly challenging task (Magiati, Tay and Howlin, 2014).

For the purpose of this article, we have adopted the Odom, Collet-Klingenberg, Rogers, and Hatton (2010) definition of evidence-based interventions (EBIs). The authors state that an intervention meets criteria for an EBI when it is demonstrated to be effective by: '(a) at least two experimental or quasi-experimental group design studies carried out by independent researchers; (b) at least five single case design studies from at least three independent investigators; or (c) a combination of at least one experimental and one quasi-experimental study and three single case designs from independent investigators' (pp. 276–277). Large scale systematic reviews have identified numerous intervention strategies that are considered to be EBIs (eg National Autism Center, 2015; Odom et al, 2010; Wong et al, 2015). In intervention research with children and youth with ASD, this support comes largely from single-subject studies, along with a few quantitative group design studies. These interventions mostly are derived from applied behaviour analysis (ABA), such as visual schedules (Cihak, 2011; McClannahan and Krantz, 2010), differential reinforcement (Lanovaz and Argumedes, 2010), visual supports (Koyama and Wang, 2011), and self-monitoring (Apple, Billingsley, Schwartz and Carr, 2005).

Challenges and facilitators in implementation of EBIs

Although EBIs for students with ASD are established, barriers exist that affect teachers' ability to implement them as intended (Greenwood, 2001). This gap exists for many reasons including: (a) the fact that evidence-based interventions are perceived as difficult to implement (Domitrovich et al, 2008; Langley, Nadeem, Kataoka, Stein and Jaycox, 2010; Odom, 2009); (b) insufficient training (Mandell et al, 2013); (c) lack of time to dedicate for training or implementation (Pellecchia et al, 2015); and (d) systemic and fiscal constraints (Cook and Odom, 2013; Forman, Olin, Hoagwood, Crowe and Saka, 2009). This suggests that schools and educators will need additional frameworks and support to implement EBIs with fidelity (Mandell et al, 2013; Noell, Duhon, Gatti and Connell, 2002).

Facilitators of intervention implementation include educator factors (eg teacher buy-in; Durlak and DuPre, 2008), organisational support, such as providing ongoing coaching and performance feedback to enhance implementation of practices learned in large-group format (Snyder, Hemmeter and Fox, 2015), and goal alignment between stakeholders including educators and families (Deschesnes, Martin and Hill, 2003; Stahmer and Aarons, 2009). The strongest predictors of implementation tend to be systemic factors, such as administrator attitudes, financial support, district policies, and how administration prioritises sustained team coordination and professional development (Deschesnes et al, 2003; Han and Weiss, 2005). Because this kind of support requires extensive coordination among administrators and policy-makers, systemic factors may unfortunately be more difficult to address in intervention than child, teacher, and family factors.

In sum, it is reasonable to hypothesise that implementation of EBIs, though challenging, is likely to be important for improving outcomes of students with ASD (Cook et al, 2012; Wong et al, 2015). Promoting implementation will require not only providing training in EBIs but also developing a model for overcoming challenges by incorporating feasible and flexible frameworks that school teams can use for selecting and supporting the implementation of EBIs that have contextual fit and meet the individualised needs of students with ASD.

Table 1: MAAPS Modules

Core characteristic	Targeted area of concern	Modules
Cognitive-academic difficulties	Requires assistance to engage or complete academic activities	Environmental modifications Reinforcement systems
	Struggles to learn new skills	Choral responding Differentiated instruction Directed note taking Graphic organisers Individualised instruction Learning strategies Peer tutoring Response cards
	Struggles with transitions	Schedules Visual cues
Problem behaviour	N/a	Classroom supports Functional behaviour assessment Functional analysis Behavior support plan
Social communication and interaction	Developing and engaging in social interactions	Functional communication Augmentative and alternative communication Peer partner Play skills
	Sustaining social interactions	Group activities Dramatic play Conversation Nonverbal communication Recognising social cues
	Developing friendships	Peer networks Nonverbal communication Recognising social cues
Restricted and repetitive behaviour	Difficulty handling unexpected changes	Planning for the unplanned Schedules
	Repetitive behaviours	Vocal stereotypy Non-dangerous (non-vocal) stereotypy Sensory differences Automatically reinforced SIB
	Restricted interests or rituals	Increasing variability Engagement Rituals Sensory differences

The MAAPS Model

The Modular Approach to Autism Programs for Schools (MAAPS) is a comprehensive framework for use by school teams in selecting, implementing, and evaluating EBIs. Developed by researchers across three sites (University of South Florida, University of Rochester Medical Center, and the May Institute) along with feedback from experts in the field, MAAPS builds upon the existing EBI literature by focusing on systemic factors that will enhance intervention implementation by educators in authentic elementary (grades PK-5) school settings. To achieve this goal, a collaborative and active coaching process was developed in which school teams are guided by a MAAPS coach to select one or more EBIs matched to individual student needs, and to then customise the chosen interventions to match contextual factors (eg staffing) while still meeting the needs of a specific student. The active coaching process, adapted from practice-based coaching (Snyder et al, 2015) and behavioural skills training (Miltenberger et al, 2004), includes instruction, modelling, rehearsal, reflection and performance feedback. University research project staff have served as MAAPS coaches with each holding a Master's or Doctoral degree in Behaviour Analysis, School Psychology, or Clinical Psychology, and having a background in behaviour analysis and school-based interventions for students with ASD. MAAPS interventions are packaged within 'modules' to address the four domains that span the core and associated characteristics of ASD: (a) social communication and interaction; (b) restricted or repetitive behaviours, interests, or activities; (c) cognitive and academic difficulties; and (d) problem behaviour (see *Table 1* for a list of MAAPS modules). Modules include all relevant materials to effectively assist the teacher in the development and implementation of the intervention, including detailed coaching conceptual overviews and outlines of procedural steps for development of each strategy, vignette examples, supplemental materials to assist in intervention development, and teacher-friendly measures for progress monitoring, self-reflection, and self-assessment of fidelity. Within the MAAPS protocol, coaches are trained by the project PIs in the MAAPS modular interventions, using didactic instruction and role playing prior to working with specific student-based teams. MAAPS coaches provide active ongoing support to the teacher throughout implementation of selected modular interventions and data-based decisions are made contingent upon data trends.

The support is primarily provided on-site; however, in some cases coaching is provided by alternative methods (eg email, phone, virtual) contingent upon teacher preference. A recently completed pilot study suggests that the intervention has promise for yielding improved outcomes in core and related characteristics of students with ASD (Anderson et al, in review).

Purpose of the study

Some of the challenges to implementation of EBIs can be framed within our knowledge of implementation science and the conduct of dissemination and implementation (DI) research, specifically in examining the issues that contribute to the research-to-practice gap (Fixsen, Blase, Horner and Sugai, 2009; Fixsen, Naoom, Blase, Friedman and Wallace, 2005). DI research often uses an iterative process that gathers input from key stakeholders on interventions prior to implementation, refines the intervention based on the feedback, and continues the process until the intervention is in its final development and ready for implementation (Beidas, Mehta, Atkins, Solomon and Merz, 2013). Perspectives from persons who would be primarily affected by the intervention, including those who will be using it, those who are vested in the outcomes, and those who will be recipients of it, inform researchers of the intervention's feasibility, usefulness, and practicality as well as identify the challenges that may affect its implementation (Palinkas et al, 2011). Thus, taking a page from DI research, this present study's purpose was to learn more about the current use of EBIs for students with ASD and the barriers that might be encountered when a school or district adopts a comprehensive model such as MAAPS. We also hoped to identify factors that might enhance the social validity of MAAPS in public schools. Specifically, we wanted to generate discourse between key stakeholders who did not have any familiarity with MAAPS on the feasibility of schools adopting a model that would address systems issues by embedding a coaching process that promotes collaborative decision-making in the selection, implementation and evaluation of EBIs that match student needs, contextual factors and current teacher skill levels. Finally, although we were particularly interested in issues related to MAAPS implementation, we hypothesised that the findings could be of general interest to investigators looking for ways to bridge the research-to-practice gap.

Method

Recruitment and participants

Purposeful sampling (Patton, 2002) was used to identify participants who had experience with students with ASD in the context of their employment. Directors of Special Education were contacted in school districts that had provided the researchers with letters of agreement to participate in the MAAPS research project to assist with identifying and inviting participants from three stakeholder groups: school administrators, educators, and caregivers. To participate, an educator had to be currently serving at least one elementary school student with ASD in their school/classroom. Similarly, participating caregivers were required to have a child with ASD currently enrolled in a district elementary school. Focus groups were scheduled based on agreed upon times and at locations provided

by the school districts. Participants were offered gift cards at the conclusion of their participation. The study was approved as exempted by the Institutional Review Board (IRB) at the University of Rochester, which served as the coordinating IRB for the three sites.

A total of 69 participants attended 14 focus groups conducted in Florida, New York and North Carolina (see *Table 2* for participant demographics). The focus groups ranged in size from two to eight participants (mean = 5). Due to scheduling conflicts, one site conducted interviews, rather than a focus group, with administrators. This resulted in individual interviews with two administrators and a joint interview with another two administrators.

Table 2: Focus group demographics

Variable		Parents or caregivers	Educators ^a	Administrators ^b	All study participants
Focus groups		4	6	3	13
n		14	34	21	69
Race or ethnicity					
	Black	2	1	-	3
	Hispanic	1	-	-	1
	Multiracial	-	1	-	1
	White	11	32	21	64
	Not reported	-	-	-	-
Gender					
	Female	11	33	15	59
	Male	3	1	6	10
Years of experience in position					
	1–5	-	15	12	17
	6–10	-	7	3	10
	11–15	-	3	3	6
	16–20	-	2	2	4
	> 20	-	2	-	2
	Not reported	-	5	1	6
Years of experience with ASD					
	1–5	-	8	1	9
	6–10	-	4	3	7
	11–15	-	7	5	12
	16–20	-	3	5	8
	> 20	-	3	6	9
	Not reported	-	9	1	10

^a Note: Educator participants included teachers, school psychologists, speech pathologists, instructional aides, and student teachers

^b Note: One site conducted two individual interviews with two administrators and one concurrent interview with two administrators

Data collection

Focus groups were used as the primary method of data collection because they provide an opportunity for in-depth facilitated conversations among participants. Focus groups formed for this study aligned with the following characteristics (Krueger and Casey, 2000; Denscombe, 2007): (a) sessions were organised by prompts that were introduced by a facilitator; (b) the facilitator did not need to adopt a neutral role; and (c) interactions between group members, beyond the discourse, were observed and noted. Separate focus groups were organised for parents, educators, and school administrators in order to capture unique or diverse perspectives of these stakeholders. The educator group included teachers, school psychologists, speech pathologists, instructional aides, and student teachers. It should be noted that some teacher participants were also parents of children with ASD.

Focus group facilitators included members of the research teams at each site, all of whom had professional experience in schools and special education. All facilitators were masters or doctorate-level university research staff who had received training from the research project qualitative researcher in the focus group protocol and methods. Each site had at least one research staff member who had prior experience independently conducting and publishing qualitative research. The structure of the focus groups and question and probes were outlined in an interview guide (see *Table 3*).

Focus group questioning routes were developed collaboratively by members of the research teams at each site. Although the protocols differed for parents, educators and administrators, all were structured to query participant perspectives about barriers to effectively supporting students with ASD, supports necessary to implement EBIs (ie strategies designed to support students with ASD that have empirical support), and adopting a modular approach to selecting EBIs that includes an active-coaching implementation strategy. A semi-structured interview protocol based on the school administrator focus group protocol was developed for the individual interviews. No information on MAAPS was provided prior to the focus groups or interviews; however, each session began with a five-minute video overview of MAAPS, followed by a standardised PowerPoint presentation on the MAAPS model. These overviews were shared and participants were given the opportunity to ask clarifying questions about the model prior to beginning the focus group.

Focus groups lasted approximately 90 minutes, and individual interviews were between 30 and 45 minutes in duration. All focus groups were conducted by a moderator and co-facilitator who were MAAPS research project personnel. Individual interviews were conducted by telephone with either the interviewer or a co-interviewer taking notes. Focus groups and interviews were audio-recorded with the permission of participants and subsequently transcribed verbatim to text for analysis. Both transcripts and audio recordings were digitally stored in accordance with IRB guidelines.

Data analysis

Content analysis of focus group and interview data followed the standard conventions of team-based qualitative research, which requires a process of regular discussion among team members as themes and patterns are identified (Guest and MacQueen, 2008). Focus group and interview transcriptions were the primary source of data used for analysis. Audio recordings were accessed for clarification as needed. All data were collected prior to initiation of data analysis.

An initial set of codes based on focus group questions was identified and defined a priori. After the initial codes were tested and collaboratively modified by representatives from each site, a codebook with code names and definitions was developed. In addition, the team developed inclusion criteria, exclusion criteria, and examples of how each code should be applied (Guest and MacQueen, 2008; Miles, Huberman and Saldana, 2013). The research team remained open to the development of additional codes when unidentified themes or subthemes arose during analysis. This resulted in the identification of five primary code categories as well as the development of sub-codes for each primary code.

Data analysis was conducted at both the individual and cross-site levels over four months. This was a multi-stage process in which at least two members of the research team for each site independently coded their site's transcripts for a specific primary code and its sub-codes. This was followed by a series of cross-site team meetings via web-conference in which coding results were discussed, both to resolve disagreements and to identify potential cross-site themes. To facilitate this process, coded transcript passages for each site were entered into a shared database, and evidence supporting cross-site as well as differential or contradictory evidence was discussed. Intercoder reliability (Guest and MacQueen, 2008; Silverman, Ricci and Gunter, 1990) was developed through discussion

Table 3: Summary of code categories and corresponding questions for each stakeholder group

Code category	Parent FG	Teacher FG	Admin FG
A: Needs of students with ASD	1: What do you think is most important for teachers to address when they are working with a child with ASD? 2: What are some things you think are particularly difficult for teachers to do when working with students with ASD?		
B: School/district implementation context		7: What barriers would you see to implementing MAAPS in your school? In other words, what might make it difficult or impossible for MAAPS to be implemented in your school? 8: What supports are already in place at your school that might facilitate MAAPS implementation?	1: What are some features of your school or district that are strengths for supporting students with ASD? 2: What are some barriers that you currently face in your efforts to best meet the needs of all students with ASD in your school or district? 3: What would help you better support all students with ASD? 4: How do you think the MAAPS model and coaching would work in your school? 7: Thinking about your school climate, what are some factors or features that may enhance or inhibit the success of our coaching model?
C: MAAPS module approach and content	3: After reviewing the modules, are there additional strategies that you would like to see included? 4: Are there any modules that we have included that you do NOT think are important?	1: How do you think teachers will feel about using this process to select interventions for their students? 2: In your opinion, what is most helpful and least helpful about how the MAAPS modular approach works?	5: How do you think teachers and others in your school would perceive MAAPS and the coaching model?
D: MAAPS coaching process		6: How would the coaching process fit into your teaching day? 3: How do you think the coaching process described would help develop interventions that are feasible for teachers to implement? 4: How do you think the coaching process described would hinder development of feasible interventions or impact teacher willingness to implement? 5: What is your opinion on the number of coaching sessions when considering balancing your other teaching responsibilities? Should there be more or less?	6: How easily would this collaborative coaching model be to fit into a school day at your school?
E: Willingness to participate	5: If your child were participating in MAAPS, in what ways would you like to be involved? 6: What would make you more or less likely to enroll your child in MAAPS?		

of similarities and differences in coding decisions, resulting in consensus around the most appropriate code for the relevant data. During this iterative process, codes and code definitions were modified to reflect the shared understanding of team members.

The process of coding and cross-site theme identification was repeated for each of the five primary codes and sub-codes. Because the transcripts represented a wide range of stakeholder perspectives, analytic guidelines required that themes specific to parent, educator or school administrator participants be consistently supported across sites in order to be included among the cross-site findings. Team analyses were shared periodically with the full research team, and a full report of results across all code categories was provided to the team for feedback and final consensus on codes. Due to time and budgetary constraints, member checks were not conducted.

Results

Results suggest that across stakeholder groups, participants found it challenging to identify and secure the resources necessary to adequately meet the needs of students with ASD. Educators reported that they often had to prioritise short-term goals, such as recruiting and retaining staff, at the expense of long-term strategies that could promote a sustainable framework for building district capacity in implementing EBIs and supporting the longer-term needs of students with ASD. As depicted in *Figure 1*, three primary themes emerged related to using EBIs to support students with ASD. These findings highlight the challenge of balancing immediate needs with sustainability of EBI implementation. The relationship across themes is best described as nested in that stakeholder perceptions of how the MAAPS model fits in classrooms is affected by educators' skills and that both are ultimately affected by availability of resources. Most illuminating, the inclusion of the MAAPS coach in the classroom helping the teacher emerged as the feature that more clearly explained why MAAPS was perceived as useful, particularly among the administrator participants. Data suggest that participants perceived the inclusion of the MAAPS coach as a significant support in meeting their immediate classroom needs. And while some participants endorsed MAAPS as a model that could provide a framework for selecting, implementing, and customising EBIs and making data-based decisions, the more enthusiastic comments from participants were related to the coach's physical presence in the classroom and providing that 'extra set of hands'. The remainder of this section will discuss the three major themes that emerged from the data analysis.

In the following sections, we will present findings related to each theme. We will use excerpts from the focus groups and administrator interviews to demonstrate the participant interpretations of how each theme relates to immediate short-term and long-term needs for professional development, capacity building, and meeting needs of students with ASD.

Resources: Inadequate availability of resources

We asked several questions about potential barriers to implementation of EBIs. Although educators acknowledged the importance of using interventions supported by research, they uniformly stated that a lack of resources was a significant barrier. For example, a parent participant in NC said, *'So probably the biggest challenge is that there are things we have on paper that we all agree need to happen, but there aren't enough people to make sure they happen.'* This stance was echoed by an administrator in Florida who described the shortage of personnel in this way: *'And even the support we get through ESE [exceptional student education], there's so few people for the number of schools we have and the number of kids with these kind of behaviours.'* An administrator from NY stated, *'Teachers who have been teaching students with disabilities, whether they've been special ed. or general ed.... they have experienced over the last like five years, their perception is they are doing more with less.'*

Figure 1: Nested model explanation of relationship between themes related to implementation of EBIs for students with autism spectrum disorders



Several respondents indicated feeling overwhelmed by competing demands and inadequate resources. For example, a NY Administrator said, *'I think sometimes, too, what I'm hearing is that teachers are really stressed in terms of all the expectations that are placed on them.'* The struggle to meet needs with limited or no resources was perceived by some participants as an overwhelming factor that left teachers little to no time to do anything beyond getting through each day. For example, a parent in NC stated, *'There is only so much that the teacher can do, but our structure is set up that these things should be happening in the classroom and she's just one person. She just physically can't.'* Concerns also extended beyond time constraints to basic classroom needs:

I would say that that one of the biggest struggles is just finding materials. I could probably do a lot more things with my kids but I mean my kids have really high needs so they have multiple things that they need. (Teacher, NC)

This perception of teachers trying to do their best but being overwhelmed by the requirements of the students with ASD was echoed by administrators.

What we've started to realise is that it's really important to individualise and be flexible based on their needs, and I think that's a particular challenge because sometimes the level of need is quite high and because of that teachers tend to struggle with how to individualise, especially in a classroom of 20 students. (Administrator, NY)

I think we have teachers that love kids, but I think everyone is so overwhelmed that a lot of times coming up with an intervention is just met with, like, just my head's going to explode, I don't have any more energy to devote to this child because of the load that everybody's carrying. (Administrator, NC)

In some cases, participants talked about resource challenges related to lack of funding to purchase EBI materials such as kits or programs. Not having available funds prevented them from implementing EBIs.

Every time we look at doing an intervention, the first thing we're doing is saying, OK how do I get the materials, how do I get the supplies? And even this year, we've had some new teachers and they've come to me because they don't have Boardmaker, they don't have means for making picture schedules. (Educator, NC)

Several responses illustrated perceptions of financial constraints not only for purchasing EBI-specific materials but for basic daily lesson planning. For example, a teacher in NC described the lack of basics that would assist in making visual materials as such: *'Financially, there's a lot of schools that don't even have colour printers. Or a laminator or some of those things.'* Another teacher in NY said: *'Even like the timers, because there are things that are too much money. Like where is that one kitchen timer that we have?'*

Participants also commented that the lack of support, specifically materials and supplies, ultimately resulted in teachers spending their own money to purchase them, as noted by a teacher in NC: *'If you need things and resources, they usually need to be purchased by the teacher or the person with the attitude.'*

Finally, some participants stated that resources were scarce in their school's community, and that in turn, affected the family's ability to collaborate with the school. For example, a Florida administrator commented: *'One of the things I struggle with, parents, not because they don't want to but because there are not a lot of resources in our county for these parents, and it's a huge struggle.'*

Skill Building: Lack of sufficient training to successfully implement evidence-based strategies

Comments about the modules included in the MAAPS model and the skills required for successful implementation in classroom settings highlighted a conflict between participants' perception of the current status of implementation of EBIs in their district and the skills held by teachers to implement them successfully. Many participants did not view the MAAPS model as providing a framework for utilisation by school teams to select, implement, and evaluate specific modular interventions to address student needs. Instead, they honed in on the modular topics as isolated interventions loosely connected to the MAAPS model. As such, after reviewing the modules included in MAAPS, a frequent comment from participants was that their district was already implementing the EBIs. This occurred even in light of receiving materials and descriptions of the MAAPS decision-making process. Some found the list of modular topics as validation for what they perceived they were already doing.

I think that in some ways, when I look at the list of modules (EBIs), some of this is stuff that we are already doing. So, it's more like empowering teachers, letting them know that these are things you're already doing. (Teacher, NY)

On the other hand, some participants indicated that teachers did not have the training or the skills to implement EBIs. As one administrator in NY stated, 'My people are screaming for help. Over and over and over.' Another administrator in NC said, 'I have a new [general education] teacher who never had training. The teacher's brand new and she's never had [autism specific] training.' Concerns around training were not limited to special education classroom teachers: 'I also think that the training that our paraprofessionals get, that our aides get, that's just not enough either, and they're the ones that work mostly with the kids.' (Teacher, NY). Another teacher from NC indicated, 'A lot of general education [teachers] don't get information and don't [understand] the disability.'

An interesting perspective on skill-building and training was the 'more is better' approach. Several comments talked about the quantity of training provided in districts, although several could not describe exactly what was trained nor articulate specific implementation goals of the training. For example, one Florida administrator stated, 'We had three women from district, from this department, come out and do training – several weeks of training – with our staff on how to work with children with autism.' Another administrator from NC viewed any type of training on ASD as something that would always be helpful by stating:

All teachers in our county could benefit from some type, and all staff members, could benefit from some type of training that could help us improve how we deliver student services to all of our students on the autism spectrum.

In some cases, participants, specifically administrators, indicated that the lack of training and skills is a factor in sending students with ASD to more restrictive placements. For example, an administrator from FL said, 'We would like to keep our students in our school that are on the spectrum, but it is just that training or have that someone or something that supports them.'

Discussion from parent stakeholders suggested that teachers did not have the support nor the skills to adequately address the needs of the students. Upon reviewing the MAAPS module list, a parent (FL) commented, 'I don't think the teachers are given the time, opportunity, or training if we're looking at the top three boxes [of MAAPS modules/interventions] to address any of them.' Another parent (NC) stated, 'The one thing I want to add is that literally the strategies... I feel like the general ed. teachers just don't literally have the strategies. They just don't have the strategies in their toolbox to use.'

Some parents linked the lack of preservice preparation of teachers as a reason teachers do not have the necessary skills to address the needs of students with ASD. One parent suggested teachers who lack an understanding of EBIs are not only ill prepared in meeting the needs of students with ASD, but that they may additionally hold a negative bias toward having any students with disabilities in their classroom:

A lot of special or gen. ed. teachers don't even have, they don't take any special ed. courses, and then when they get in the classroom, they're like OK, and now they're required to take them but there's only one [course]. And you hear a lot of them saying [in training], I'm never gonna teach a student with a disability. Yeah, you are! (Parent, NC)

MAAPS contextual fit: Positive acceptance of model primarily due to addressing immediate needs

The final theme reflects responses from participants in relation to the value, need and acceptability of MAAPS for their students/children. In general, responses indicated that MAAPS would be very welcome in their settings as another professional development opportunity provided by skilled trainers or experts and would be the support needed to implement EBIs. The inclusion of the coach who would have the skills to help teachers with overwhelming needs was the primary feature that made MAAPS highly acceptable. One administrator (NC) stated:

I think that the model would be a phenomenal asset because there you have an expert, someone who knows, who can actually help you. And the teachers cry for help. They need help, but I'm just trying to make it through the day, so we would benefit.

Focus group participants also liked the systematic collaborative process that the coach would use with teachers.

You're including the teacher in all of the decisions. You would include them with the intervention, you would include them if you were going to adapt or change in any way your approach to what you're doing. And I think that is huge for our teachers here. They need to feel they are part of the whole process that is going on. (Teacher, FL)

Administrators also recognised the benefit of the collaborative model:

People can come up with good ideas, but actually making them happen is kind of where we fall down. So, what I'm hearing you say is the MAAPS coach would be someone to help implement some of the ideas that are generated in the collaborative environment. (Administrator, NY)

Similar to the first two themes, however, responses focused on the MAAPS contextual fit as a solution to the lack of resources and to teacher stress, as opposed to ongoing implementation, capacity building, and sustainability of EBIs.

And that is, that the model seems like it's streamlined enough to take some mental burden off the gen. ed. teacher. If that were to happen, and it freed up something in the gen. ed. teacher's day, and we were able to keep that void from immediately being filled up by something else, I think we'd see a different climate. I think the morale of our teachers would be better. (Administrator, NC)

There was also appreciation for the systematic guidance that would allow teachers to customise intervention programs. One FL teacher indicated, *'I think a lot of them just in the classroom are not getting what they need. So, this is going to be specific and we are going to see gains.'* Other sites echoed this sentiment:

This is nice to be able to see an easy way to pick out 'OK this the key thing right here that we've got to target first' or 'these are the two pieces' and the way that it breaks down into that flowchart I think is helpful for everyone on the team to pinpoint a few particular areas. (Teacher, NY)

Other responses indicated that MAAPS would be welcome if it could truly reduce the burden for teachers. These responses suggested that if anything were added to the teacher's responsibilities, it needed to be something that did not add to teachers' feelings of being overwhelmed. For instance, an administrator (NC) said, *'As a teacher, I'm gonna need to know, what are you gonna take off my plate so I will have the time and the space in my brain to take this on?'* Another administrator concurred saying, *'This may take the place of some of the time commitments the teachers have, partially. I agree with you though. They're overwhelmed, so we'd need to alleviate some of that.'*

Discussion

In the last two decades, there has been widespread agreement on the need for increased use of evidence-based interventions for students with ASD. Unfortunately, schools continue to struggle to identify, implement and sustain implementation of EBIs. To learn more about this gap, we obtained and analysed perceptions of stakeholders – parents, administrators, and educators – on the challenges schools face when implementing interventions for students with ASD, and how comprehensive approaches, such as the MAAPS model, could fit within typical school environments. Although there is previous research on the many barriers to implementing EBIs with students with disabilities, such as ASD (eg Greenwood and Abbott, 2001; Hess, Morrier, Heflin and Ivey, 2008; Wong et al, 2015), this study may assist the field by illustrating why schools continue to have significant challenges applying proven strategies in schools and by identifying features of comprehensive intervention models that would be accepted by schools and families to assist in meeting the needs of students with ASD. To examine these issues, focus groups and individual interviews were conducted with educators and parents across three sites. Overall, consistent with reports in prior studies (eg Iadarola et al, 2015), results suggested that schools struggle with implementing EBIs due to the prodigious need for resources and skill building. A new finding in this study is that these problems, often referred to as overwhelming by the participants, force schools to focus on strategies to resolve immediate needs at the expense of more careful, long-term capacity building and sustainability of implementation of EBIs. In light of these immense needs, which some stakeholders described as just trying to survive each day, the comprehensive MAAPS model was viewed positively; however, the primary feature that was consistently emphasised was the inclusion

of a coach who guides the school team in selecting, developing and implementing the interventions; and most importantly, is present in the classroom to help the teacher with implementation. The findings of this study have significant implications for future implementation of EBIs in schools. Implementation considerations are discussed below.

Educators judge EBI frameworks by individual components. One of the salient features of MAAPS and other EBI intervention packages is the underlying structure that provides end users with a systematic process for selecting and evaluating interventions that can successfully ameliorate targeted concerns of individual students. The comments made by the current study's focus group participants suggested that they did not understand how the interventions comprising MAAPS were inter-related nor why MAAPS or other EBI intervention packages are effective. Instead, they frequently mentioned one or two components (eg the assistance of the coach) that elevated MAAPS's acceptance. This lack of understanding of how programming components work together may be a key feature contributing to the research-to-practice gap and educator acceptance of EBIs. This finding has been suggested by previous research (Callahan, Henson and Cowan, 2008). It is important for future researchers and educators to identify methods that can enhance school district personnel's understanding of the conceptual underpinnings of EBIs and the inter-relatedness of features and frameworks that have an impact on the effectiveness of EBIs.

Professional development is primarily viewed as an 'outcome'. Throughout the focus group discussions, the need for more skill building via training was brought up repeatedly. However, training, in and of itself, appeared to be viewed as a general solution for the various challenges faced in educating students with ASD. The groups did not discuss the existence of or even a need for strategic professional development planning that would identify the primary skills needed by educators, provide the professional development at the level of intensity required, and deliver the ongoing coaching support that includes modeling, practice, reflection, and performance feedback. Instead, training sometimes seemed to be regarded as the solution to many of the barriers. Indeed, some participants did not name specific skills or training needed; rather, any training was perceived as a 'good' thing. This view of training delivery is not surprising; indeed, systems change literature is rife with guidance to decrease the reliance on institutes, workshops and other didactic presentations

as the primary vehicles for professional development and instead focus on how to provide coaching supports that allow the recipients of training to reach skill-specific goals (eg Kretlow and Bartholomew, 2010; Odom, Duda, Kucharczyk, Cox and Stabel, 2014).

Approaches that include active-based coaching processes are viewed favourably due to the presence of an additional person in the classroom to help the teacher rather than capacity-building opportunities. Comments from focus group participants highlighted that schools and educators feel overwhelmed in their attempts to implement strategies for students with ASD. When asked about the acceptability and fit of the MAAPS model in school settings, the majority interpreted it as a valuable asset, and that it would be something they would want to have in their schools. However, the surprising outcome from this study was why the stakeholders liked MAAPS and the coaching process. Although there was acknowledgement that the model would provide someone with expertise to support the teacher, many mentioned that having someone physically present in the classroom to help reduce the burden on teachers was the most acceptable feature. This perception persisted even in light of educator and administrator participants stating they were already implementing EBIs for students with ASD.

This view of MAAPS as an 'extra set of hands', unfortunately, revealed that having a systematic, comprehensive model that provides guidance and active coaching support on implementation of EBIs may not be enough to close the research to practice gap often discussed in literature (Dingfelder and Mandell, 2011; Greenwood and Abbott, 2001). MAAPS is intended to be a collaborative team-building framework that can be used by schools as a process for problem-solving and generating solutions to meet the communicative, social behavioural and cognitive needs of individual students with ASD (Anderson, Smith and Iovannone, 2018). Yet, the focus group participant comments did not primarily emphasise that MAAPS would fit their context by being a vehicle for capacity-building and sustainability of EBI implementation. Instead, most stakeholders were consumed with resolving immediate needs such as lack of resources and skills, and viewed MAAPS as a short-term solution to help the beleaguered teachers who were 'overwhelmed'. Interestingly, this observation may be supported by behavioural economic theories of decision-making in the context of resource availability. Specifically, when resources are, or are perceived as, scarce, the need for that resource is

elevated in priority as are the trade-offs necessary for accessing them (Shah, Shafir, and Mullainathan, 2015). Thus, a district may decide that it is more important to address a resource gap by acquiring more staff than it is to adopt frameworks of EBI implementation. The quest to first meet immediate needs has potential long-term impacts on the implementation and sustainability of comprehensive models, such as MAAPS, in schools that are experiencing challenges in garnering sufficient resources to successfully address the complex needs of students with ASD.

These findings, if supported through additional research, have significant implications for our field. Although there is ample research support for strategies to be used for students with ASD, we do not have sufficient research that can identify the strategies that work in the schools, nor do we have enough research that identifies specific professional development practices that result in successful implementation of trained strategies and student outcomes. We do know, though, that unless we address the immediate barriers of lack of resources and skills, schools will continue to have challenges implementing EBIs.

Limitations and future research

There are several limitations to this study that can guide future research. First, although we recruited and selected participants for their direct experiences working with students with ASD or having a child with ASD, we did not attempt to recruit for diversity of race and ethnicity. The participants that were in this study were primarily white, and it is possible that the perceptions held by our participants differ from those who have other backgrounds and experiences. Future studies may benefit from purposefully recruiting ethnically/racially diverse participants to address the documented underrepresentation of diverse participants in research (West et al, 2016). By recruiting focus group participants of various ethnicities and races, perceptions across culturally diverse stakeholders can be compared.

Second, our participants were primarily from suburban and rural locations with the exception of the NY site. Although the issues discussed by this study's participants are themes that have emerged in other studies, future research would likely benefit from including more individuals from urban schools and neighbourhoods, especially those that may have high resource limitations, and examine whether the themes persist across diverse

school district size and setting. While one study explored parent and educator perspectives about services for ASD in urban school districts (see Iadarola et al, 2015), no studies to date have compared perspectives across urban, suburban and rural districts. Third, we did not plan for a focus group that would represent the voice of individuals with ASD. It would behoove the field to conduct additional research that collects their perspective of the challenges they experienced related to interventions being implemented along with their views on the acceptability of a model like MAAPS. Conducting member checks would also have strengthened the validity of the interpretation of the findings.

As a final limitation, stakeholders who participated in the focus groups did not have prior experience with the MAAPS programme, which may have affected their perspectives. Participant naiveté to MAAPS was by design, as the focus groups were conducted as a part of the intervention development phase. The field of implementation science (Fixsen et al, 2005) has helped us understand that developing interventions in collaboration with stakeholders is important for their adoption and long-term sustainability in community settings. Accordingly, models of DI research, such as integrated knowledge translation (Elsabbagh et al, 2014) include stakeholder perspectives as part of the research process at all phases of research, including prior to efficacy trials (Beidas et al, 2013). However, it is possible that participant perspectives would have been richer and more contextual if they had had prior understanding of MAAPS based on previous experience with its use. Future research on MAAPS therefore should include qualitative study of the perspectives of those who have implemented MAAPS in school settings.

In conclusion, this study examined the current challenges to implementing EBIs for students with ASD in schools, and evaluated the goodness of fit of a systematic and comprehensive intervention model that would provide active coaching support as a key ingredient. The results suggest that if our goal is to not only increase implementation of EBIs but to also build sustainability, it may be necessary to incorporate the principles and practices of implementation science into our efforts to disseminate EBIs for students with ASD in school settings. As noted by Bertram, Blase and Fixsen (2015), merely adopting interventions that seem to address an immediate need is not enough to ensure implementation of the practices, let alone sustain their use. New strategies and practices involve systems change efforts that surpass one-time or even one-year events; rather, they

require a long-term process in which organisations such as school districts need to consider implementation stages (ie exploration, installation, initial implementation and full implementation) and implementation drivers (ie competency, organisation and leadership) in their efforts to achieve successful outcomes for students with ASD. By engaging in long-term strategic planning, it may be possible that schools can shift their approaches from applying short-term solutions to pressing needs to implementing strategies that will be successful at improving outcomes for all students with ASD. In order to accomplish this, it may be necessary for the field to begin to conduct research on effective systemic change strategies that can shift schools from a crisis mode (surviving one day at a time) to a systematic, multi-tiered approach that can be implemented and sustained in our complex school environments.

Notes

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